INSTRUMENT CLUSTER

GENERAL INFORMATION

The instrument cluster contains an electronic speedometer, tachometer and analog fuel level gauge.

A liquid crystal (LCD) display for odometer, trip odometer and gear indicator display (for automatic transmission model) is centrally located within the speedometer face.

Control and warning lamps are situated around the peripheral area of the instrument cluster.

Notes on replacing instrument cluster

- Do not disassemble instrument cluster.
- Instrument clusters contain no field serviceable components. All malfunctions require replacement of instrument cluster.
- When the replacement of a malfunctioning instrument cluster is necessary, follow exchange part procedures.
- Complete report form and return together with instrument cluster and always use the original packaging from the new cluster when returning modules.
- The odometer reading must be matched to the new/exchange instrument cluster using an On Board Diagnostic (OBD) program
- Where applicable instrument cluster must be adapted for anti-theft immobilizer functions using an OBD program

Additional information:

- Complaint/symptom based repairs ("Service Fixes")

  See Technical Bulletins

- Instrument cluster, On Board Diagnostic (OBD)

  See **ON BOARD DIAGNOSTIC (OBD)** .

  See VAS 5051 Vehicle Diagnostic Testing and Information System or VAS 5052 Vehicle Diagnostic and Service System in mode Guided Fault Finding.

ON BOARD DIAGNOSTIC (OBD), FUNCTION

The instrument cluster is controlled by an internal microprocessor with On Board Diagnostic (OBD) capability.

If malfunctions occur in monitored sensors and components, Diagnostic Trouble Codes (DTC) will be stored in memory.

If OBD recognizes instrument cluster malfunctions related to the:

- odometer
- distance impulse number (K number)
- speedometer calibration

the trip odometer display will change to show "dEF.".

In this case, replace speedometer, See **INSTRUMENT CLUSTER, REMOVING AND INSTALLING** .

Other malfunctions recognized by OBD will not cause the trip odometer display to change as described above.

However, before performing any troubleshooting or inspection, always begin by checking for DTCs using the On Board Diagnostic (OBD) program. DTCs stored in memory are retrieved/checked with either VAG 1551/1552 Scan Tools

See **ON BOARD DIAGNOSTIC (OBD)** .

or

See VAS 5051 Vehicle Diagnostic Testing and Information System or VAS 5052 Vehicle Diagnostic and Service System in mode Guided Fault Finding.

ADDITIONAL INFORMATION, INSTRUMENT CLUSTERS FROM M.Y. 2000

Instrument clusters from m.y. 2000 are integrated into the vehicle CAN Data Bus network (may also be known as "CAN-Bus" or "Data-Bus").

The Data Bus On Board Diagnostic Interface -J533- (which is integrated into the instrument cluster) enables data to be exchanged between the vehicle CAN Data-Bus network and the Data Link Connector (DLC) "K-wire".

The Data Bus On Board Diagnostic Interface -J533- has specific On Board Diagnostic (OBD) capabilities.

OBD from m.y. 2000

See VAS 5051 Vehicle Diagnostic Testing and Information System or VAS 5052 Vehicle Diagnostic and Service System in mode Guided Fault Finding.

Notes on replacing instrument cluster

- In addition to the normal service procedure of coding the instrument cluster and adapting the odometer reading, the Data Bus On Board Diagnostic Interface -J533- must also be separately coded according to

vehicle market version and equipment level variables.

Replacing instrument cluster from m.y. 2000

See VAS 5051 Vehicle Diagnostic Testing and Information System or VAS 5052 Vehicle Diagnostic and Service System in mode Guided Fault Finding.

Additional information:

- Complaint/symptom based Technical Bulletins ("Service Fixes"):

  See Technical Bulletins.

- Instrument cluster, On Board Diagnostic (OBD)

  See **ON BOARD DIAGNOSTIC (OBD)** .

  See VAS 5051 Vehicle Diagnostic Testing and Information System or VAS 5052 Vehicle Diagnostic and Service System in mode Guided Fault Finding.

INSTRUMENT CLUSTER FROM M.Y. 2000, REPLACING

NOTE: The following OBD program procedure applies only to New Beetle from m.y. 2000 and is performed in conjunction with removal and replacement. See INSTRUMENT CLUSTER, REMOVING AND INSTALLING .

Special tools, testers and auxiliary items needed

- VAS 5051 Vehicle Diagnostic Testing and Information System or VAS 5052 Vehicle Diagnostic and Service System

Before proceeding with removal work, perform the following:

- Switch off all electrical consumers.

VAS 5051/5052, connecting

- Engage parking brake.
- Switch off all electrical consumers.
- Manual transmission: Selector lever in "Neutral" position.
- With ignition switched off, connect VAS 5051 with adapter cable to Data Link Connector (DLC) -arrow- located under the instrument panel, left.

Fig. 1: Identifying VAS 5051 Vehicle Diagnostic Testing And Information System
Courtesy of VOLKSWAGEN OF AMERICA, INC.

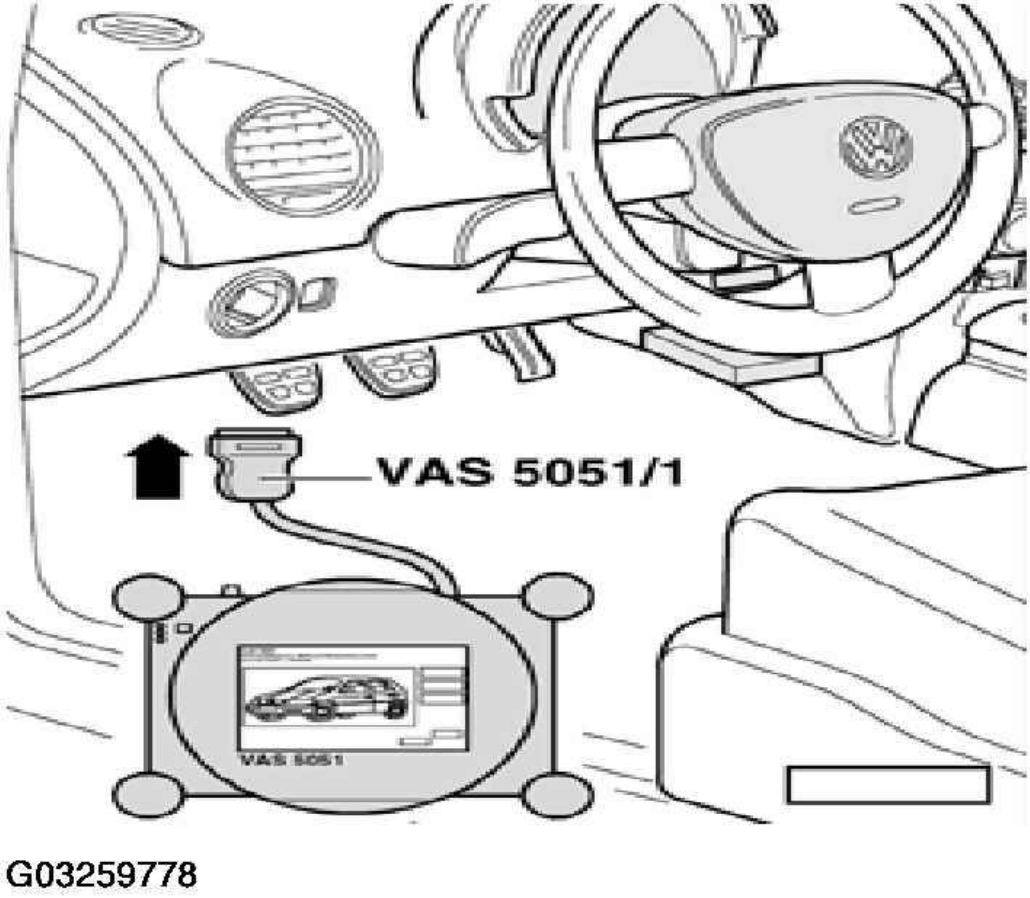

Fig. 2: Connecting VAS 5051 With Adapter Cable To Data Link Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Switch on ignition.
- Select mode "Guided Fault Finding"
- Enter appropriate model, equipment and model year information and press ">" to confirm.

After all Control Modules have been registered and DTC memories checked,

- Select "Go to"
- Select "Function / Component Selection"
- Select "Body (Repair Group 01; 27; 50 to 97)"
- Select "Electrical Equipment (RG 27; 90 to 92; 94; 96;97)"
- Select "01-On Board Diagnostic (OBD) capable systems"

- Select "Instrument panel" or "dash panel insert" where indicated
- Select "Functions"
- Select "Replacing instrument cluster with immobilizer 2. gen / 3. gen" or "Instrument cluster, replacing" as applicable
- Forward with "" button
- Follow/perform selected OBD program steps as prompted by tester.

INSTRUMENT CLUSTER, REMOVING AND INSTALLING

WARNING:

- **Special safety precautions apply to vehicles equipped with airbags.**
- **Refer to Airbag CAUTIONS and WARNINGS in the appropriate RESTRAINTS article.**

CAUTION: Before beginning repairs on the electrical system:

- **Obtain the anti-theft radio security code.**
- **Switch off all electrical consumers, switch off ignition and remove ignition key.**
- **Disconnect negative (-) battery terminal.**
- **When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing OBD program and electrical system function checks as specified.**
- **Observe the remarks and work sequence instructions for malfunction recognition and malfunction displays before removing the instrument cluster, See NOTES ON REPLACING INSTRUMENT CLUSTER .**

Removing

NOTE:

- **Removal of instrument cluster is possible without removing the steering wheel. In the following instructions, the steering wheel is shown removed for ease of illustration only.**
- **All: Observe "Notes on replacing instrument cluster". See NOTES ON REPLACING INSTRUMENT CLUSTER .**
- **From m.y 2000: Observe "Notes on replacing instrument cluster". See ADDITIONAL INFORMATION, INSTRUMENT CLUSTERS FROM M.Y. 2000 and INSTRUMENT CLUSTER FROM M.Y. 2000, REPLACING .**

If replacing a malfunctioning instrument cluster with a new one, note odometer reading on existing cluster prior to removal.

- Release steering wheel tilt/telescope lock, lower steering wheel and pull out completely. Lock into

position.

- Release trim ring -1- from instrument cluster mounting -2- clips.

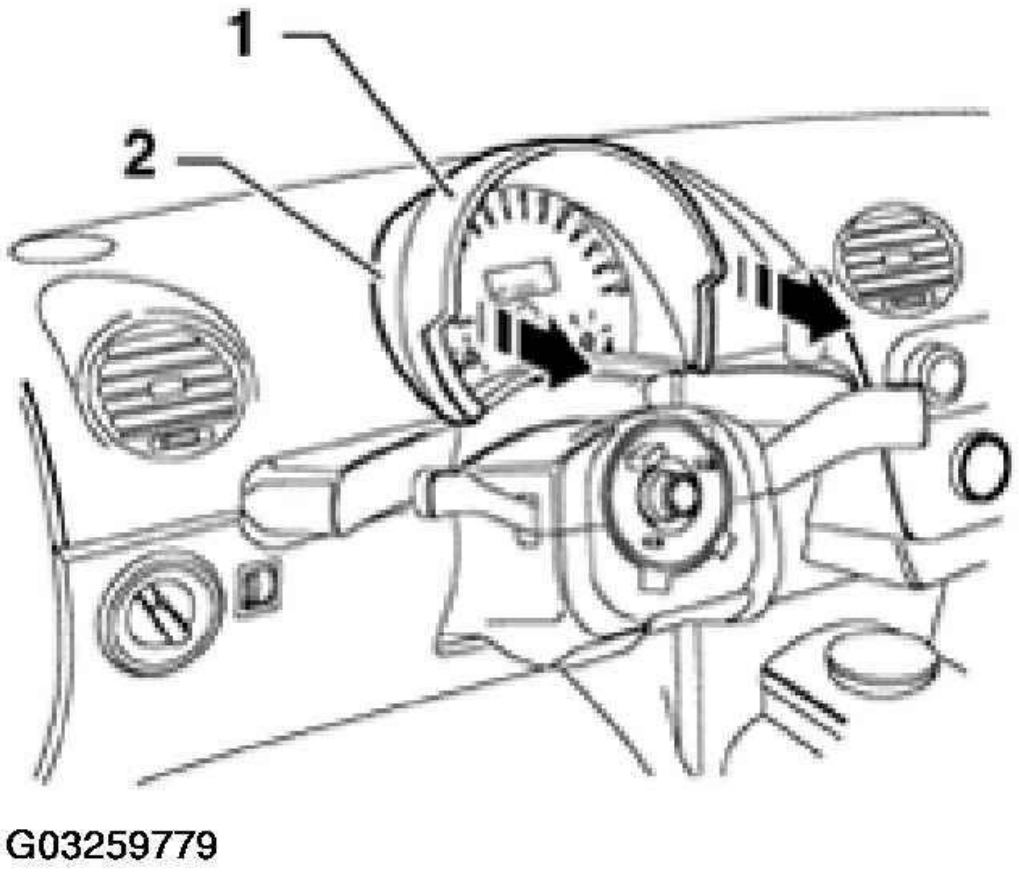

Fig. 3: Removing Trim Ring From Instrument Cluster Mounting
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Remove two screws (arrows).
- Tilt instrument cluster slightly toward passenger compartment.
- Disconnect harness connectors at rear of instrument cluster.
- Remove instrument cluster.

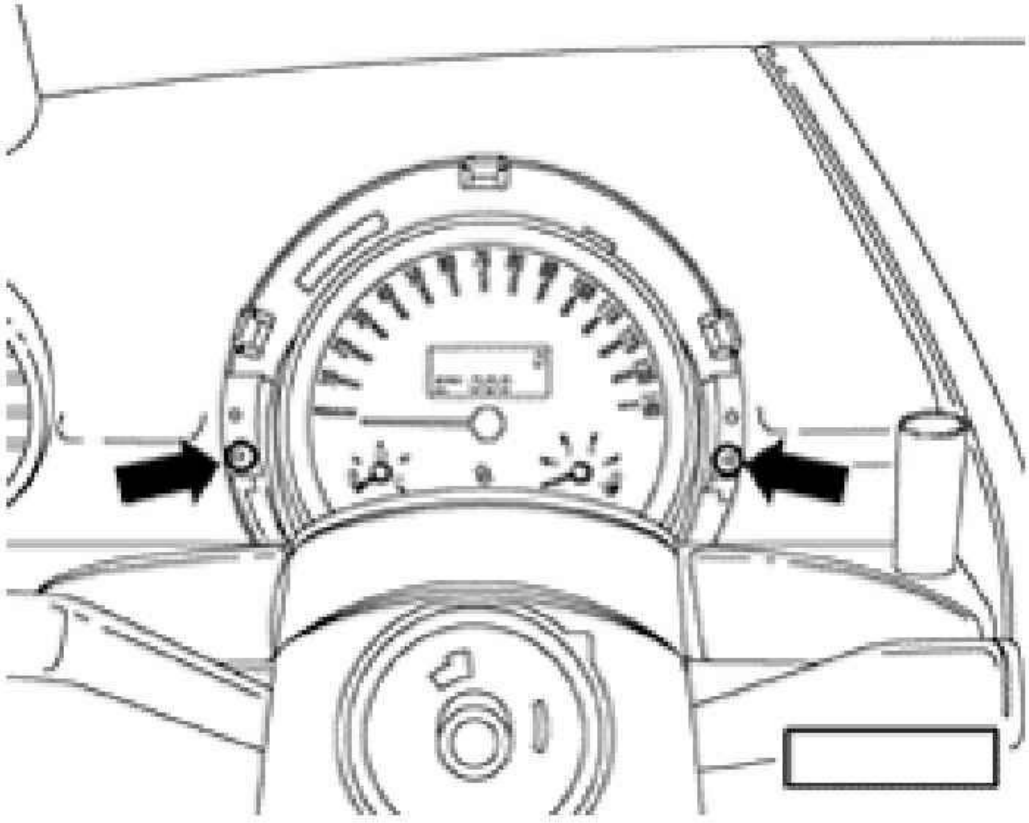

Fig. 4: Removing Two Instrument Cluster Screws
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Installing

- Install in reverse order of removal.
- Perform functional check of instrument cluster.

If replacing a malfunctioning instrument cluster, and a function check shows no further malfunctions, proceed as follows:

Through m.y. 1999

- Code instrument cluster.

  See **ON BOARD DIAGNOSTIC (OBD)** .

- Adapt odometer reading

  See **ON BOARD DIAGNOSTIC (OBD)** .

From m.y. 2000

- Perform necessary instrument cluster adaptations and coding, including coding the Data Bus On Board Diagnostic Interface -J533- and immobilizer adaptation as per OBD program.

  See VAS 5051 Vehicle Diagnostic Testing and Information System or VAS 5052 Vehicle Diagnostic and Service System in mode Guided Fault Finding.

INSTRUMENT CLUSTER MULTI-PIN CONNECTOR ASSIGNMENTS THROUGH 05.99

NOTE:

- **Instrument cluster must not be disassembled.**
- **Troubleshooting specific systems and circuits, See SYSTEM WIRING DIAGRAM and Component Locations.**
- **Additional information**

  See ON BOARD DIAGNOSTIC (OBD) .

Multi-pin connectors on instrument cluster

32-pin connector -1-, blue

- Basic functions
- Connector assignments, See **32-pin Multi-connector, Blue** .

32-pin connector -2-, green

- Expanded functions
- Connector assignments, See **32-pin Connector, Green**

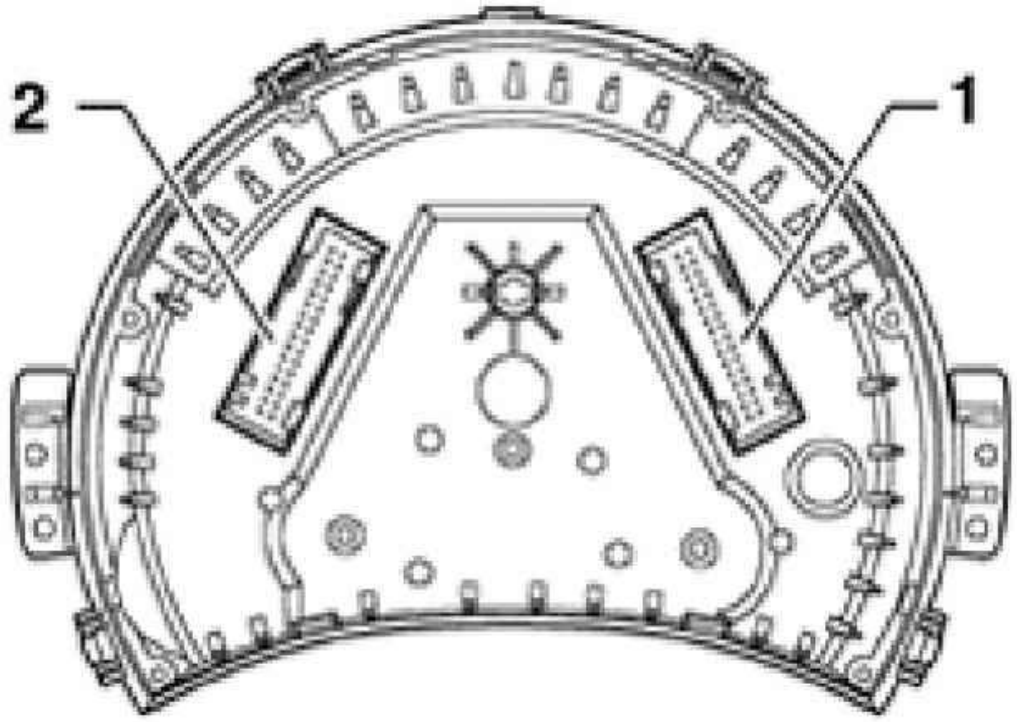

Fig. 5: Identifying Multi-Pin Connectors On Instrument Cluster (Through 05.99)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

32-pin multi-connector, blue

NOTE: The following list refers to items in Fig. 6 .

1. Terminal 15 - positive (ignition on)
2. Indicator lamp for turn signal, right
3. Output signal 1 from electronic speedometer
4. Open
5. Fuel gauge
6. Airbag Malfunction Indicator Lamp (MIL)
7. Terminal 31 - sensor/sender Ground (GND)
8. Engine Coolant Temperature (ECT) gauge
9. Terminal 31 - Ground (GND)

10. Oil pressure warning lamp
11. Engine Speed (RPM) signal
12. Terminal 61 - warning lamp for Generator (GEN),
13. Glow plug indicator light -K29- (Diesel only)
14. Open
15. Open
16. Warning lamp for rear hatch/trunk lid open
17. Terminal 56a - indicator lamp for high beam headlight
18. Indicator lamp for turn signal, left
19. Warning lamp for Anti-lock Brake System (ABS)
20. Terminal 58b - instrument cluster illumination
21. Driver's door open warning buzzer
22. Warning lamp for low Engine Coolant Level (ECL)
23. Terminal 30 - positive (B+)
24. Terminal 31 - Ground (GND)
25. Data Link Connector (DLC) K-wire
26. Parking lights, right (signal for "lights on" warning buzzer)
27. Parking lights, left, (signal for "lights on" warning buzzer)
28. Input signal - Speedometer Vehicle Speed Sensor (VSS)
29. Brake fluid level warning lamp
30. Terminal 86s - Ignition key warning buzzer
31. Seat belt warning lamp/buzzer
32. Malfunction Indicator Lamp (MIL)

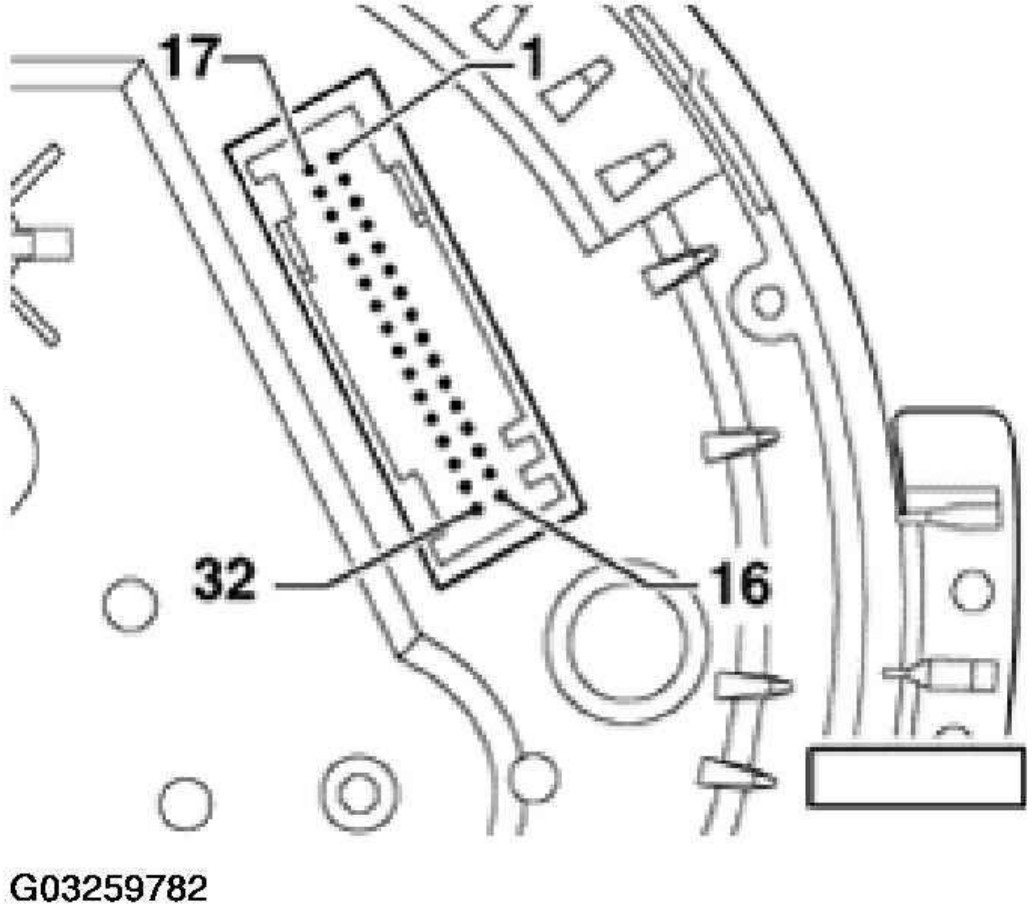

Fig. 6: Identifying 32-Pin Multi-Connector - Blue (Through 05.99)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

32-pin connector, green

NOTE: The following list refers to items in Fig. 7 .

1. Open
2. Reading coil for immobilizer (where applicable)
3. Open
4. Open
5. W-wire
6. Rear spoiler
7. Brake pad wear indicator (where applicable)

8. Open
9. Open
10. Low fuel level warning (where applicable)
11. Signal for vehicle stationary
12. A/C clutch cut-off - Engine Coolant Temperature (ECT) signal
13. Warning lamp for dual circuit brake system and handbrake
14. ABS/EDL warning lamp
15. Electronic Power Control (EPC) warning lamp (where applicable)
16. Open
17. Reading coil for immobilizer (where applicable)
18. Open
19. Open
20. Open
21. Open
22. Open
23. Open
24. Open
25. Open
26. Open
27. Open
28. Open
29. Open
30. Output signal 2 from electronic speedometer (where applicable)
31. Selector lever display (automatic transmission)
32. Open

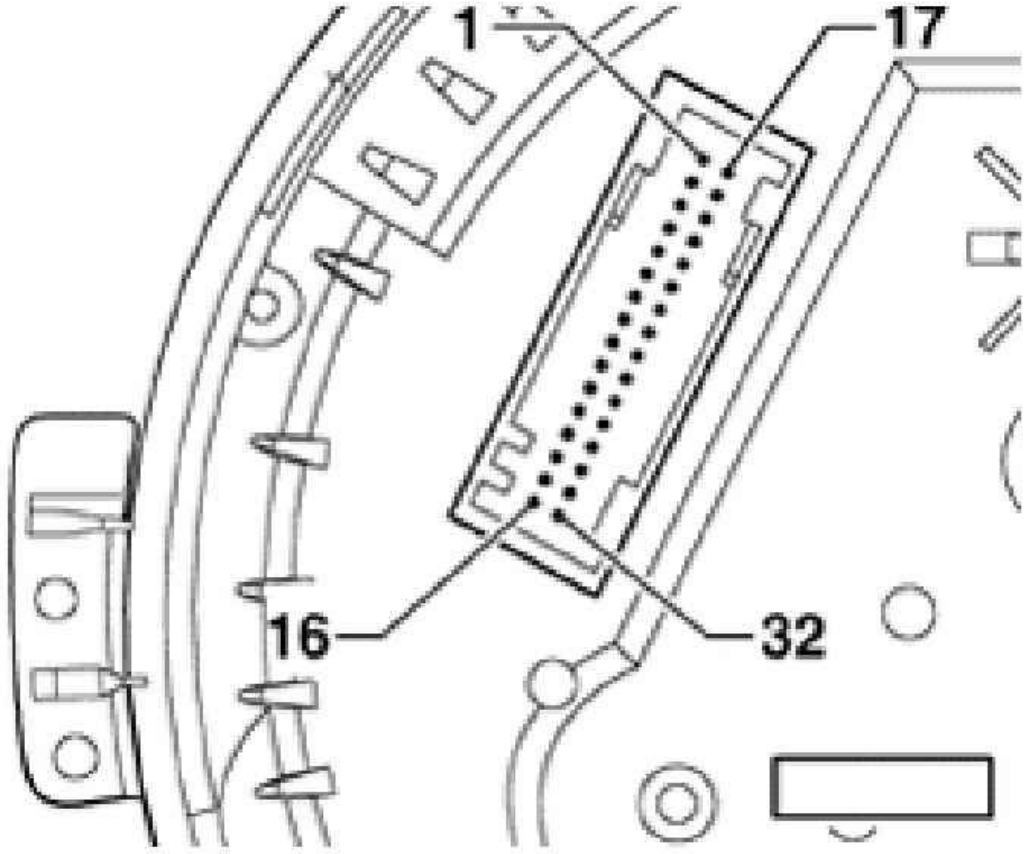

Fig. 7: Identifying 32-Pin Connector - Green (Through 05.99)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

INSTRUMENT CLUSTER MULTI-PIN CONNECTOR ASSIGNMENTS FROM 06.99

NOTE:

- **Instrument cluster must not be disassembled.**
- **Troubleshooting specific systems and circuits, See SYSTEM WIRING DIAGRAMS and Component Locations**
- **Additional information**

See **ON BOARD DIAGNOSTIC (OBD)** .

Multi-pin connectors on instrument cluster

32-pin connector -1-, blue

- Basic functions
- Connector assignments, See **32-pin Multi-connector, Blue**

32-pin connector -2-, green

- Expanded functions
- Connector assignments, See **32-pin Connector, Green**

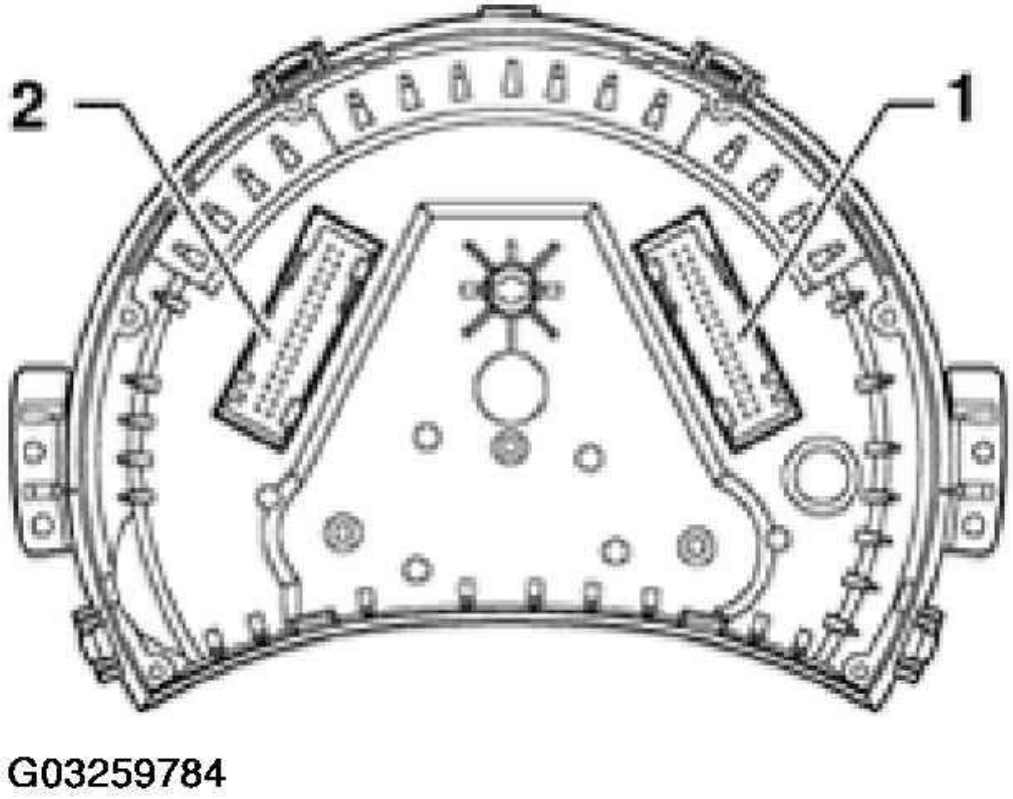

Fig. 8: Identifying Multi-Pin Connectors On Instrument Cluster (From 06.99)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

32-pin multi-connector, blue

NOTE: The following list refers to items in Fig. 9 .

1. Terminal 15 - positive (ignition on)
2. Indicator lamp for turn signal, right
3. Output signal 1 from electronic speedometer
4. Open
5. Fuel gauge
6. Airbag Malfunction Indicator Lamp (MIL)
7. Terminal 31 - sensor/sender Ground (GND)
8. Engine Coolant Temperature (ECT) gauge
9. Terminal 31 - Ground (GND)
10. Oil pressure warning lamp
11. Open
12. Terminal 61 - warning lamp for Generator (GEN),
13. Open
14. Open
15. Open
16. Warning lamp for rear hatch/trunk lid open
17. Terminal 56a - indicator lamp for high beam headlight
18. Indicator lamp for turn signal, left
19. Open
20. Terminal 58b - instrument cluster illumination
21. Driver's door open warning buzzer
22. Warning lamp for low Engine Coolant Level (ECL)
23. Terminal 30 - positive (B+)
24. Terminal 31 - Ground (GND)
25. Data Link Connector (DLC) K-wire
26. Parking lights, right (signal for "lights on" warning buzzer)
27. Parking lights, left, (signal for "lights on" warning buzzer)
28. Input signal - Speedometer Vehicle Speed Sensor (VSS)
29. Brake fluid level warning lamp
30. Terminal 86s - Ignition key warning buzzer
31. Seat belt warning lamp/buzzer
32. Open

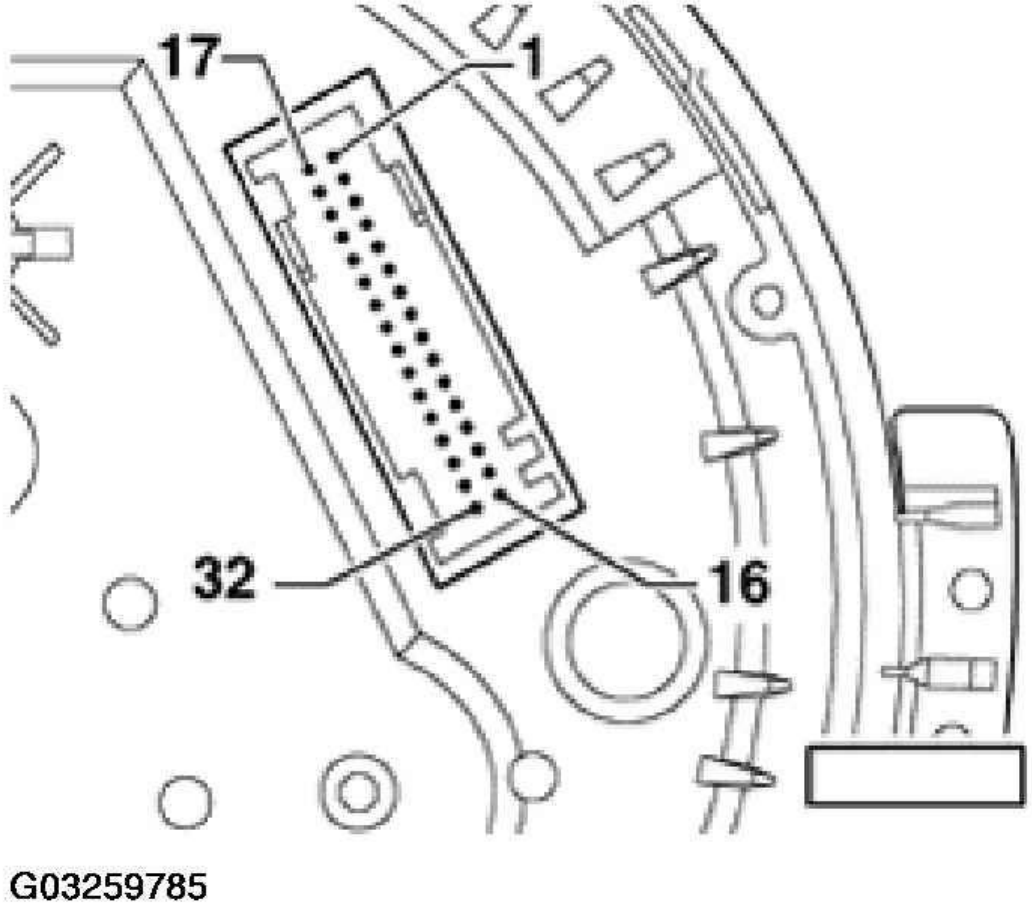

Fig. 9: Identifying 32-Pin Multi-Connector - Blue (From 06.99)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

32-pin connector, green

NOTE: The following list refers to items in Fig. 10 .

1. Open
2. Reading coil for immobilizer
3. Open
4. Open
5. W-wire
6. Rear spoiler
7. Brake pad wear indicator

8. Open
9. Open
10. Low fuel level warning
11. Signal for vehicle stationary
12. Open
13. Warning lamp for dual circuit brake system and handbrake
14. Open
15. Open
16. Open
17. Reading coil for immobilizer
18. Open
19. Interface - CAN Data Hi-Bus
20. Interface - CAN Data Lo-Bus
21. Open
22. Open
23. Open
24. Open
25. Open
26. Open
27. Interface - On Board Diagnostic (OBD) CAN Data Hi-Bus
28. Interface - On Board Diagnostic (OBD) CAN Data Lo-Bus
29. Open
30. Output signal 2 from electronic speedometer (where applicable)
31. Selector lever display (automatic transmission)
32. Open

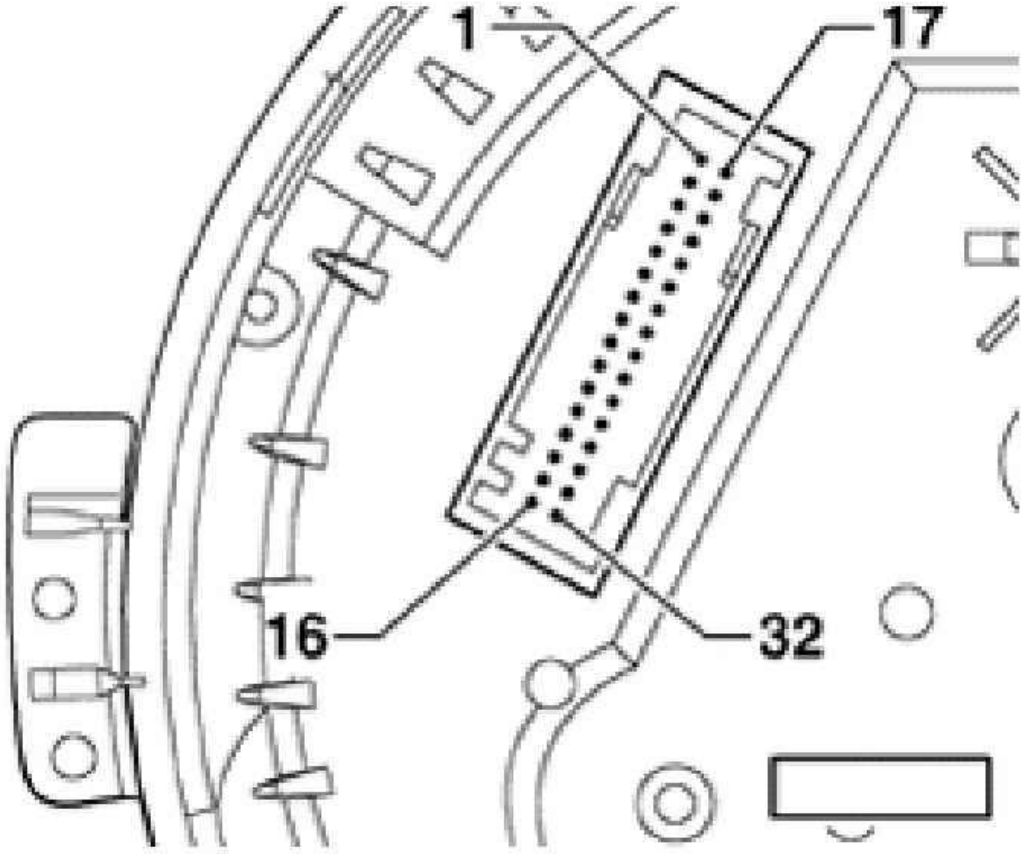

Fig. 10: Identifying 32-Pin Connector - Green (From 06.99)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Speedometer Vehicle Speed Sensor Troubleshooting - New Beetle

CHECKING SPEEDOMETER VEHICLE SPEED SENSOR (VSS) -G22-

Required for troubleshooting:

- Multimeter Fluke 83
- Connector Kit VW 1594
- Valid wiring diagram
- Appropriate Electrical Equipment article.

Always check battery Ground (GND) connections for tight fit before troubleshooting

CAUTION: DO NOT damage, enlarge or bend connector terminals or cavities by forcing probes into them when performing electrical checks. Always use connector test kit VW 1594 to make the necessary electrical connections.

Prerequisite:

Instrument cluster coding MUST correspond to model and equipment particulars. Check/confirm instrument cluster coding.

- For vehicles up to 06.99, see **INSTRUMENT CLUSTER, CODING (FUNCTION 07)** .
- For vehicles from 06.99 to 10.00, see **INSTRUMENT CLUSTER UP TO 10.00 MODELS, CODING FUNCTION (07)** .
- For vehicles from 10.00 and up, see **INSTRUMENT CLUSTER FROM 10.00 MODELS, CODING FUNCTION (07)** .

Preparation:

- Switch OFF ignition and all electrical consumers.
- Remove driver's side lower instrument panel cover. See **INSTRUMENT PANEL** .

NOTE: Up to June 1999, speedometer vehicle speed sensor is located at the rear of the transmission. From June 1999, speedometer vehicle speed sensor is located in the area of the left-hand drive shaft flange on manual and automatic gearbox vehicles.

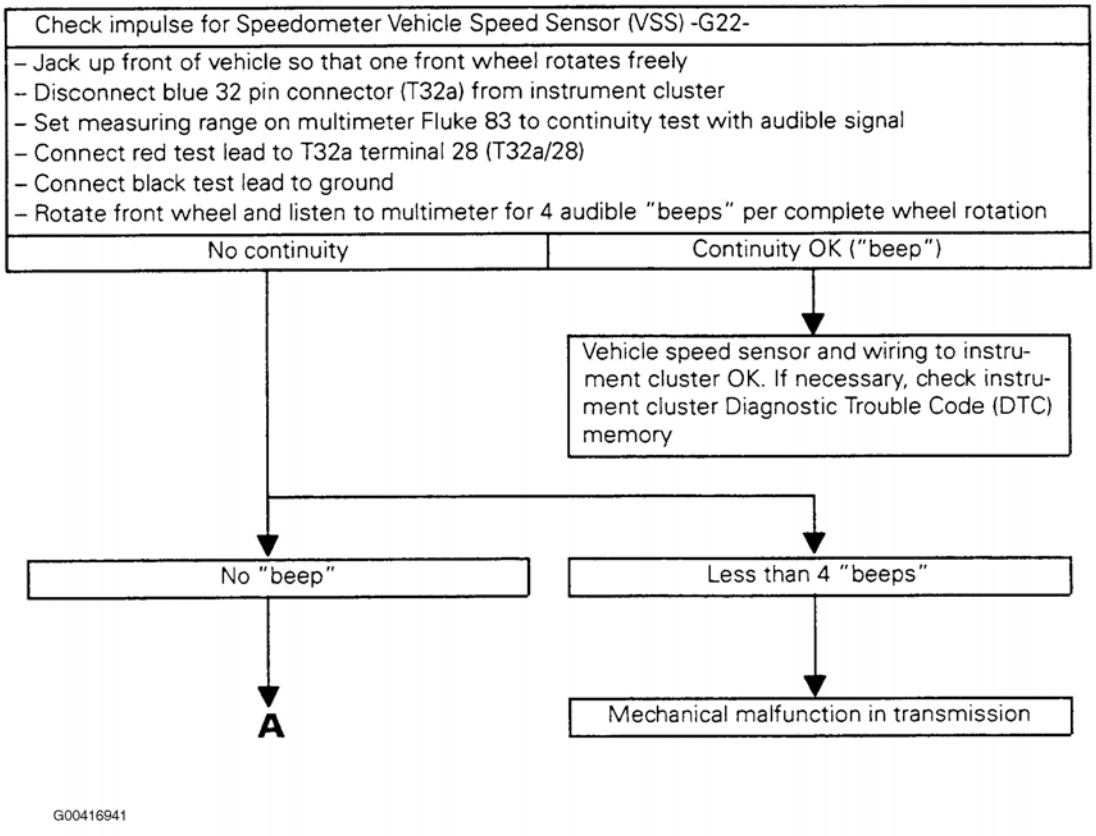
Check impulse for Speedometer Vehicle Speed Sensor (VSS) -G22-
– Jack up front of vehicle so that one front wheel rotates freely
– Disconnect blue 32 pin connector (T32a) from instrument cluster
– Set measuring range on multimeter Fluke 83 to continuity test with audible signal
– Connect red test lead to T32a terminal 28 (T32a/28)
– Connect black test lead to ground
– Rotate front wheel and listen to multimeter for 4 audible "beeps" per complete wheel rotation
No continuity
Continuity OK ("beep")
Vehicle speed sensor and wiring to instrument cluster OK. If necessary, check instrument cluster Diagnostic Trouble Code (DTC) memory
No "beep"
Less than 4 "beeps"
A
Mechanical malfunction in transmission
G00416941

Fig. 1: Speedometer Vehicle Speed Sensor Troubleshooting (1 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

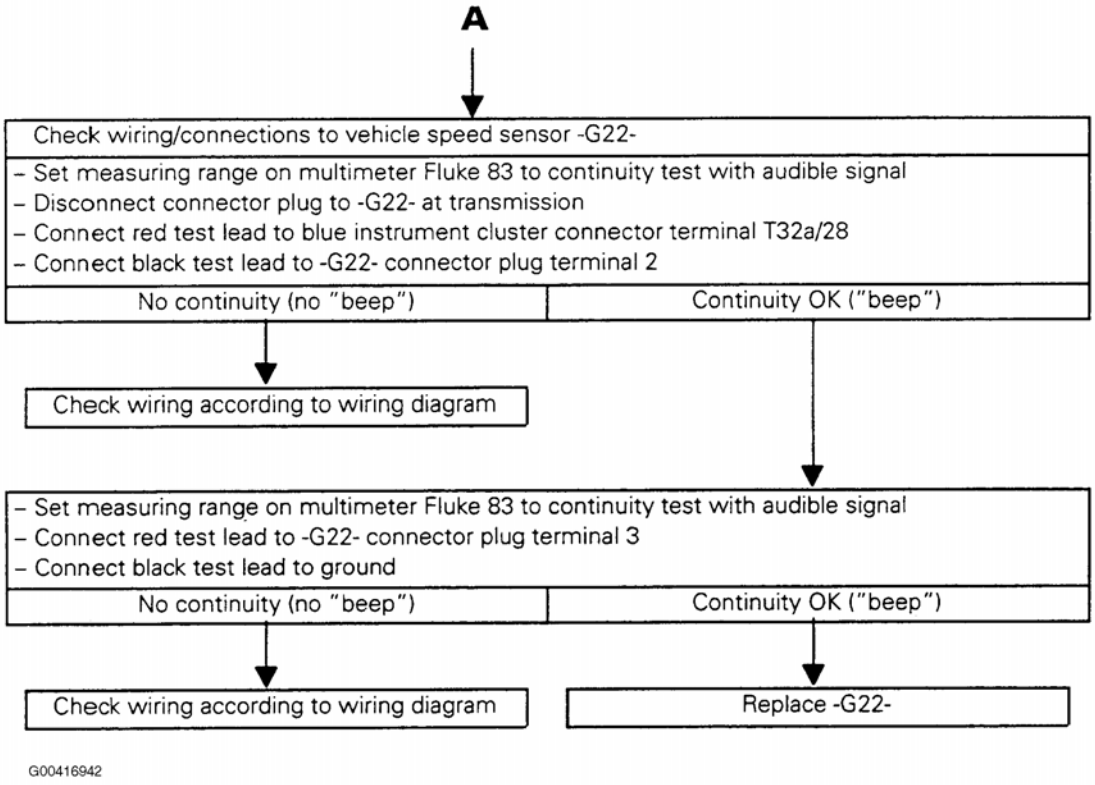
A
Check wiring/connections to vehicle speed sensor -G22-
– Set measuring range on multimeter Fluke 83 to continuity test with audible signal
– Disconnect connector plug to -G22- at transmission
– Connect red test lead to blue instrument cluster connector terminal T32a/28
– Connect black test lead to -G22- connector plug terminal 2
No continuity (no "beep")
Continuity OK ("beep")
Check wiring according to wiring diagram
– Set measuring range on multimeter Fluke 83 to continuity test with audible signal
– Connect red test lead to -G22- connector plug terminal 3
– Connect black test lead to ground
No continuity (no "beep")
Continuity OK ("beep")
Check wiring according to wiring diagram
Replace -G22-
G00416942

Fig. 2: Speedometer Vehicle Speed Sensor Troubleshooting (2 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.